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(54) **REFLECTOR ASSEMBLY FOR A RECESSED LUMINAIRE**

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G02B 5/09 (2006.01)
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See application file for complete search history.

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Primary Examiner — Jong-Suk (James) Lee

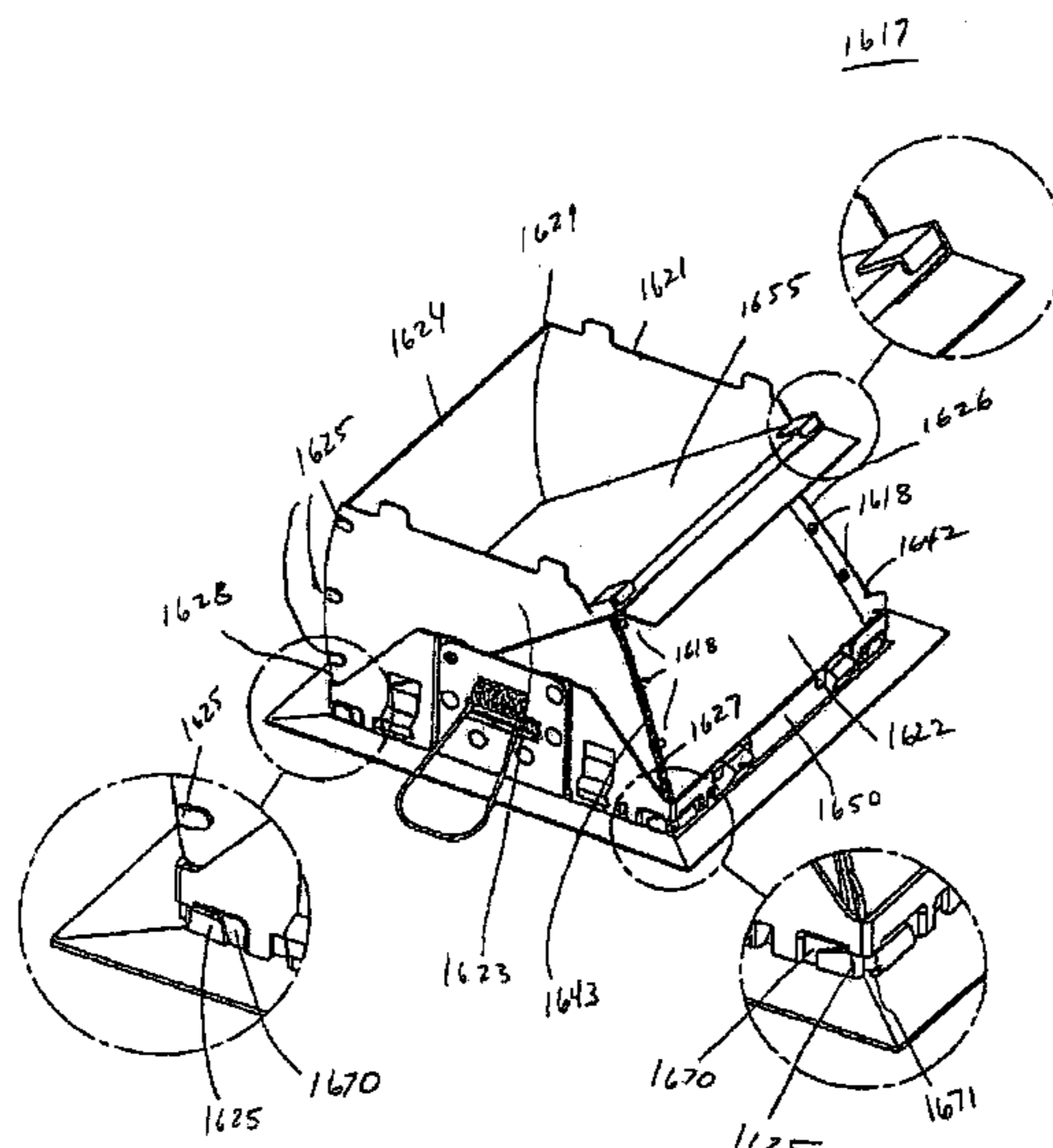
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(57) **ABSTRACT**

A reflector assembly includes a frame that maintains the integrity and shape of a multi-member reflector for a recessed luminaire. The members of the reflector are arranged in a geometric form, such as a rectangle. The frame is disposed around the reflector. The frame includes at least one integral member manipulated around a joint formed between adjacent members of the reflector. For example, the integral member can include a clamp or tab. The frame and the integral member secure the positions of the members of the reflector relative to one another and prevent light from leaking through joints between the members. One or more connectors are coupled to the frame for connecting the reflector assembly to a lighting fixture. For example, each connector can include a torsion spring coupled to a lever configured to engage a corresponding catch of a collar on the lighting fixture.

20 Claims, 15 Drawing Sheets



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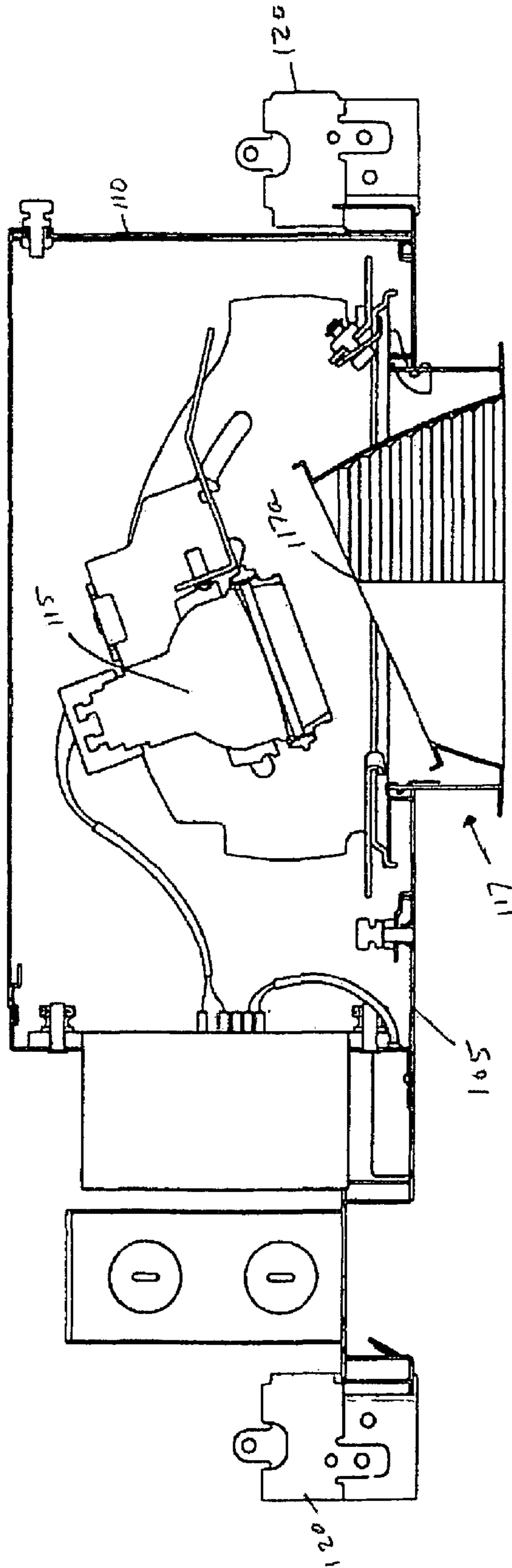


Fig. 1

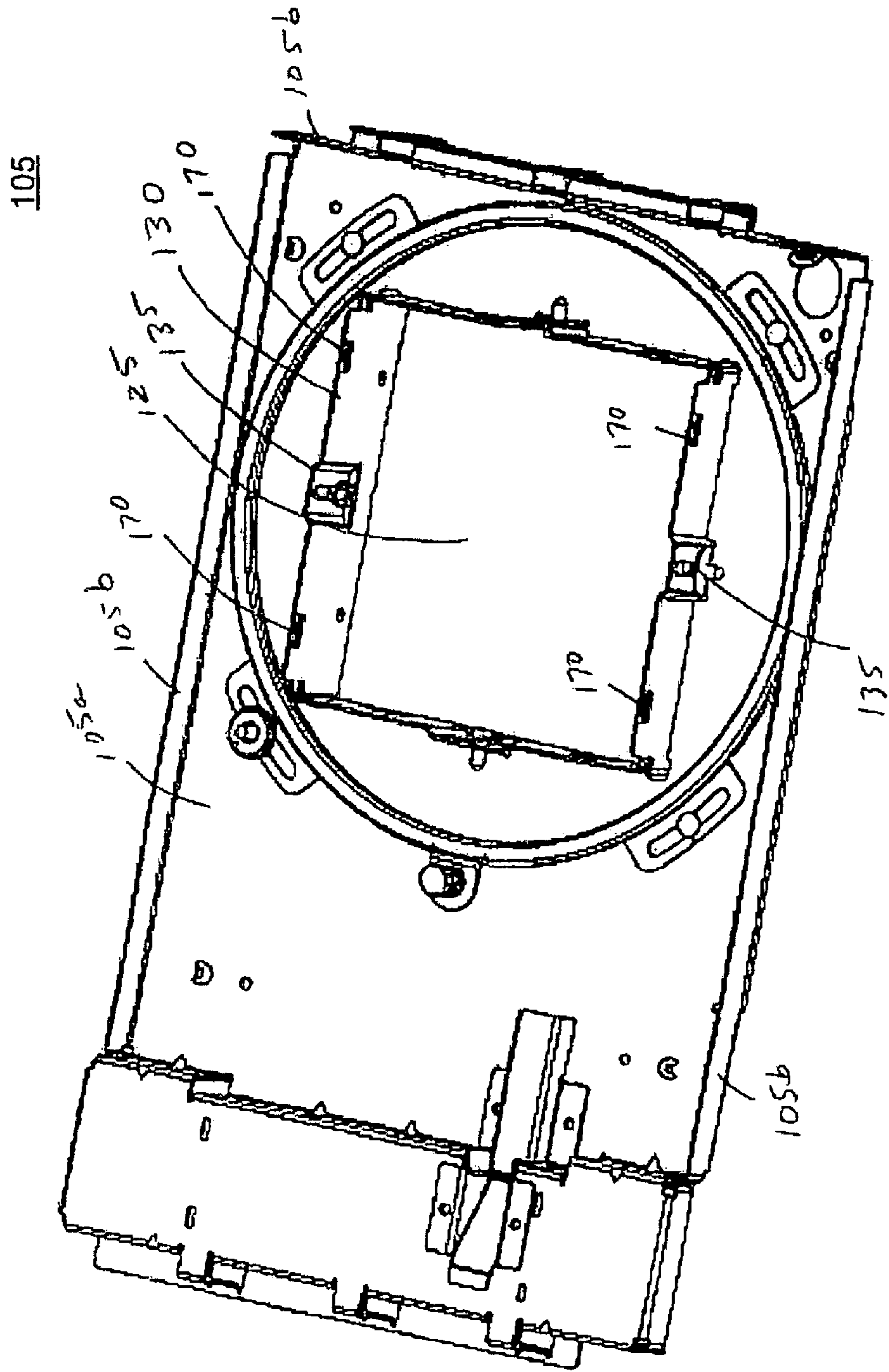


Fig. 2

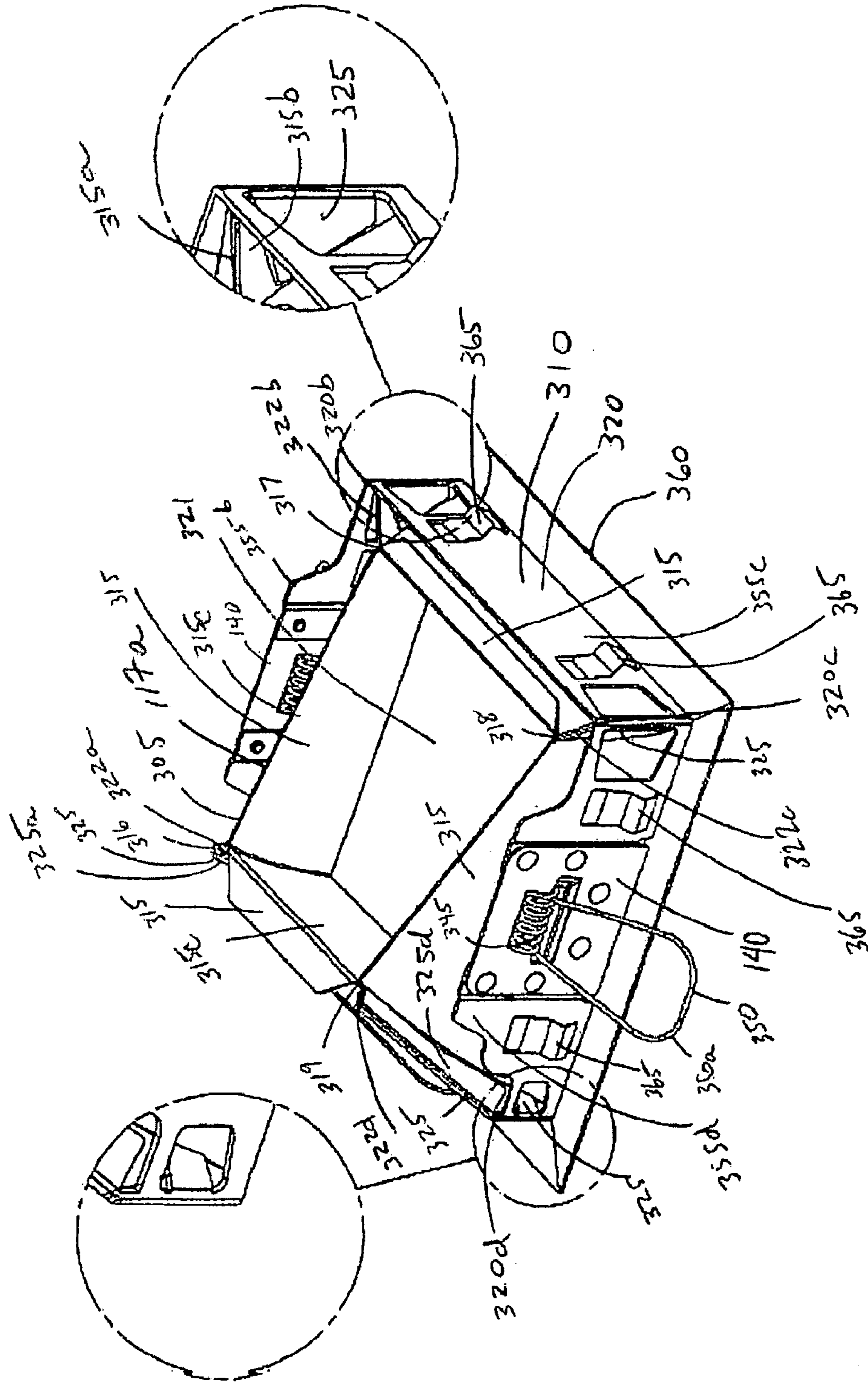


Fig. 3

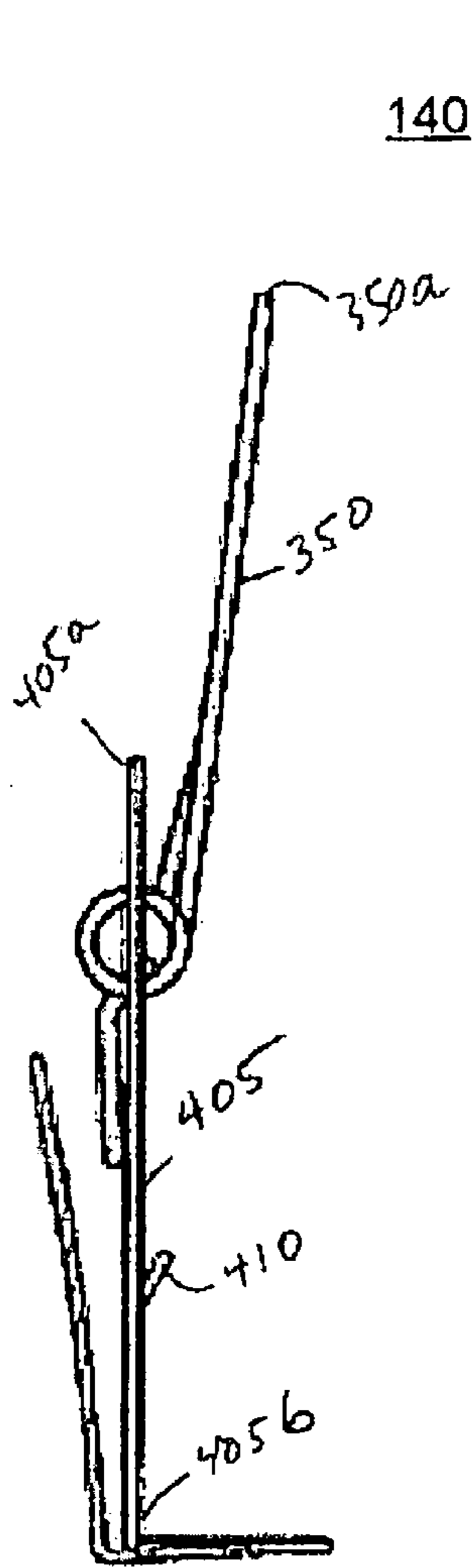


Fig. 4

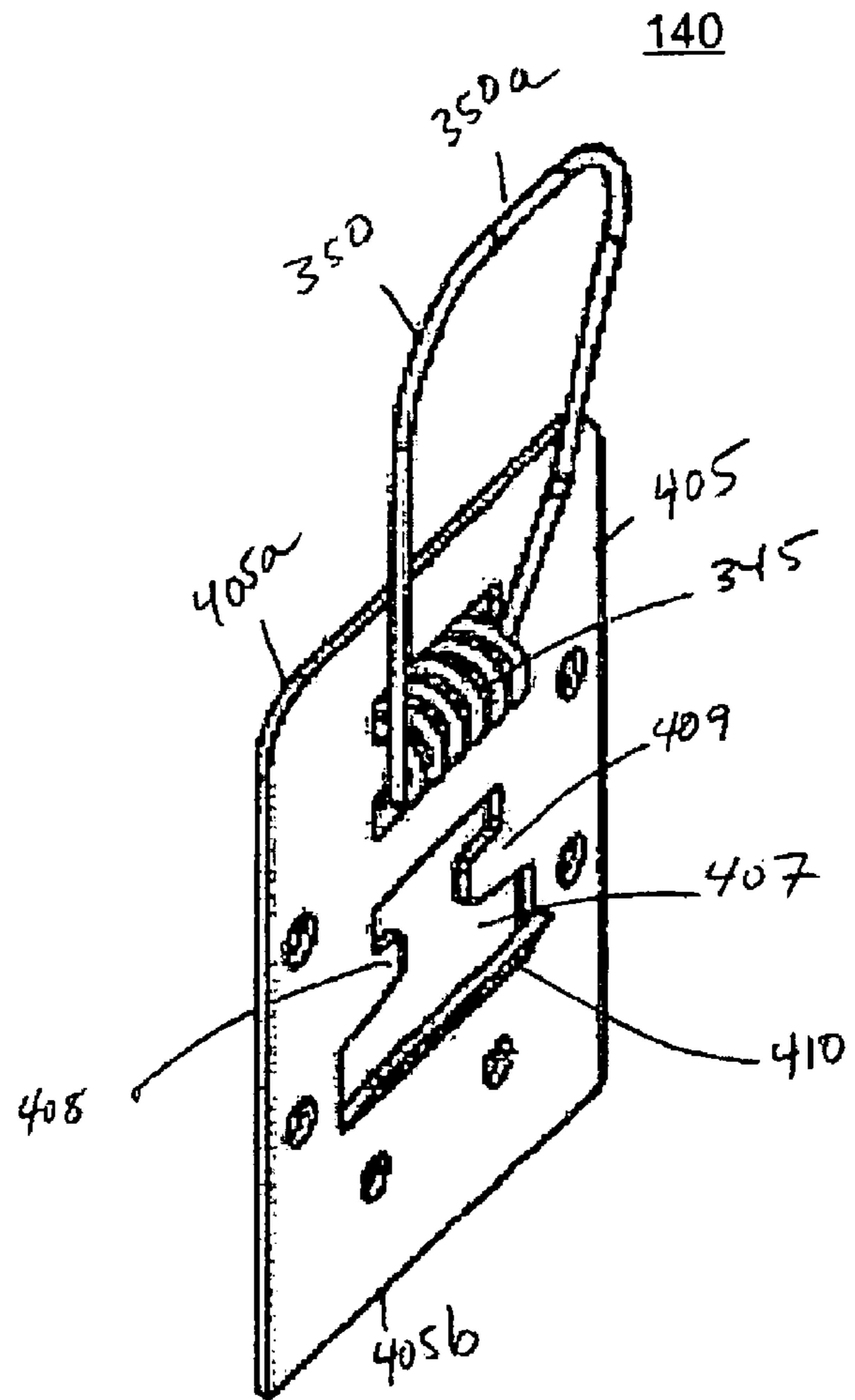


Fig. 5

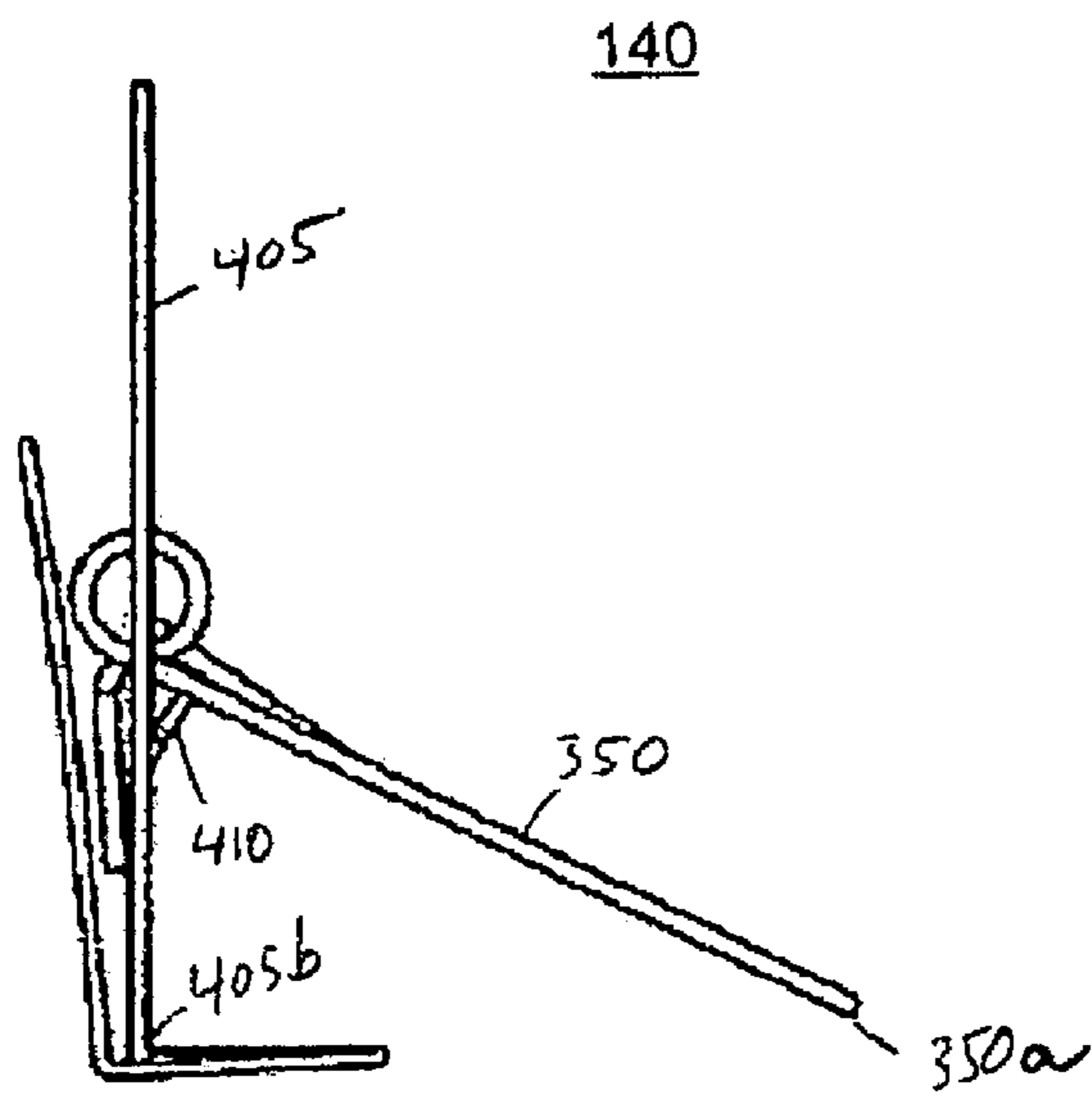


Fig. 6

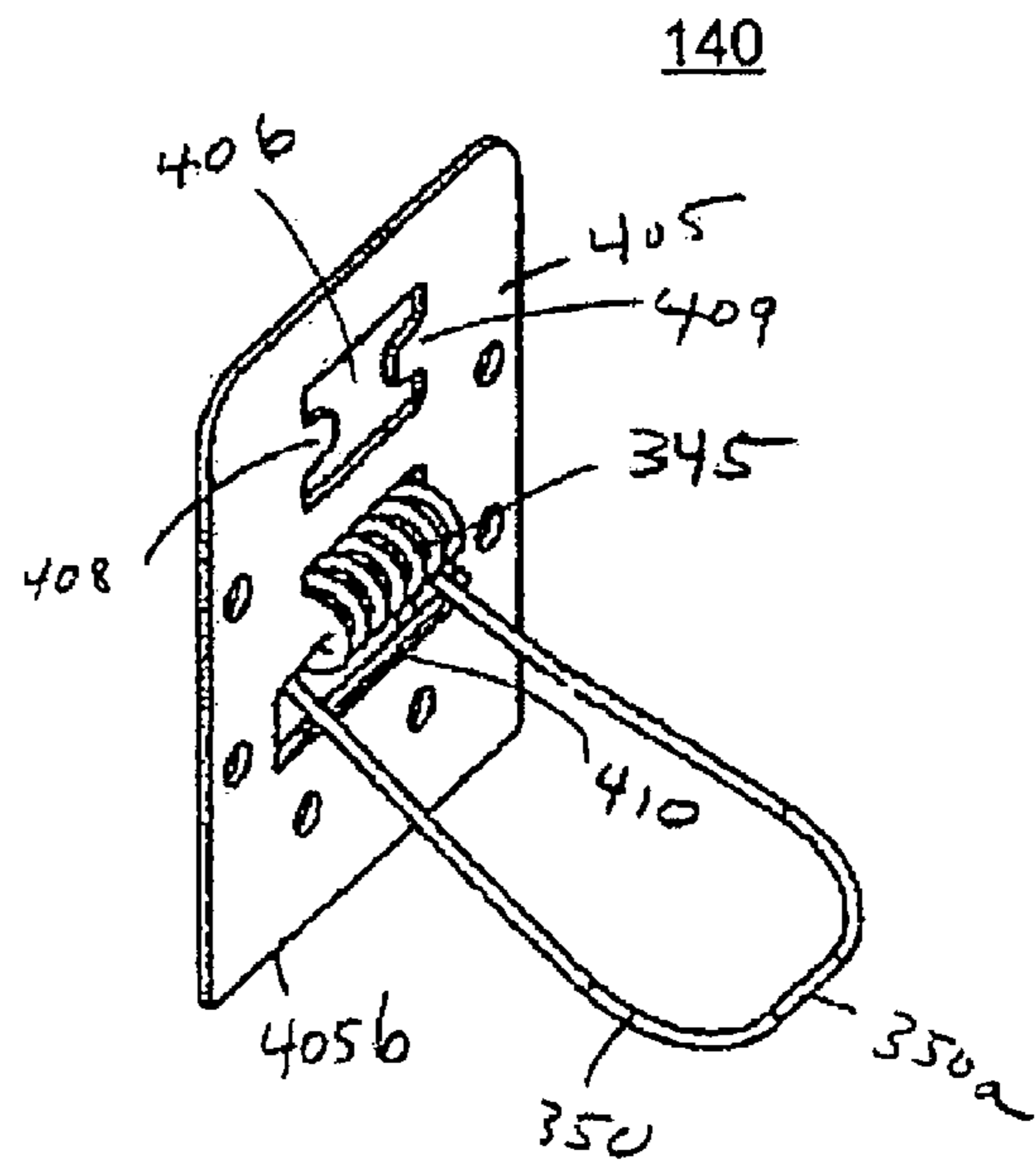


Fig. 7

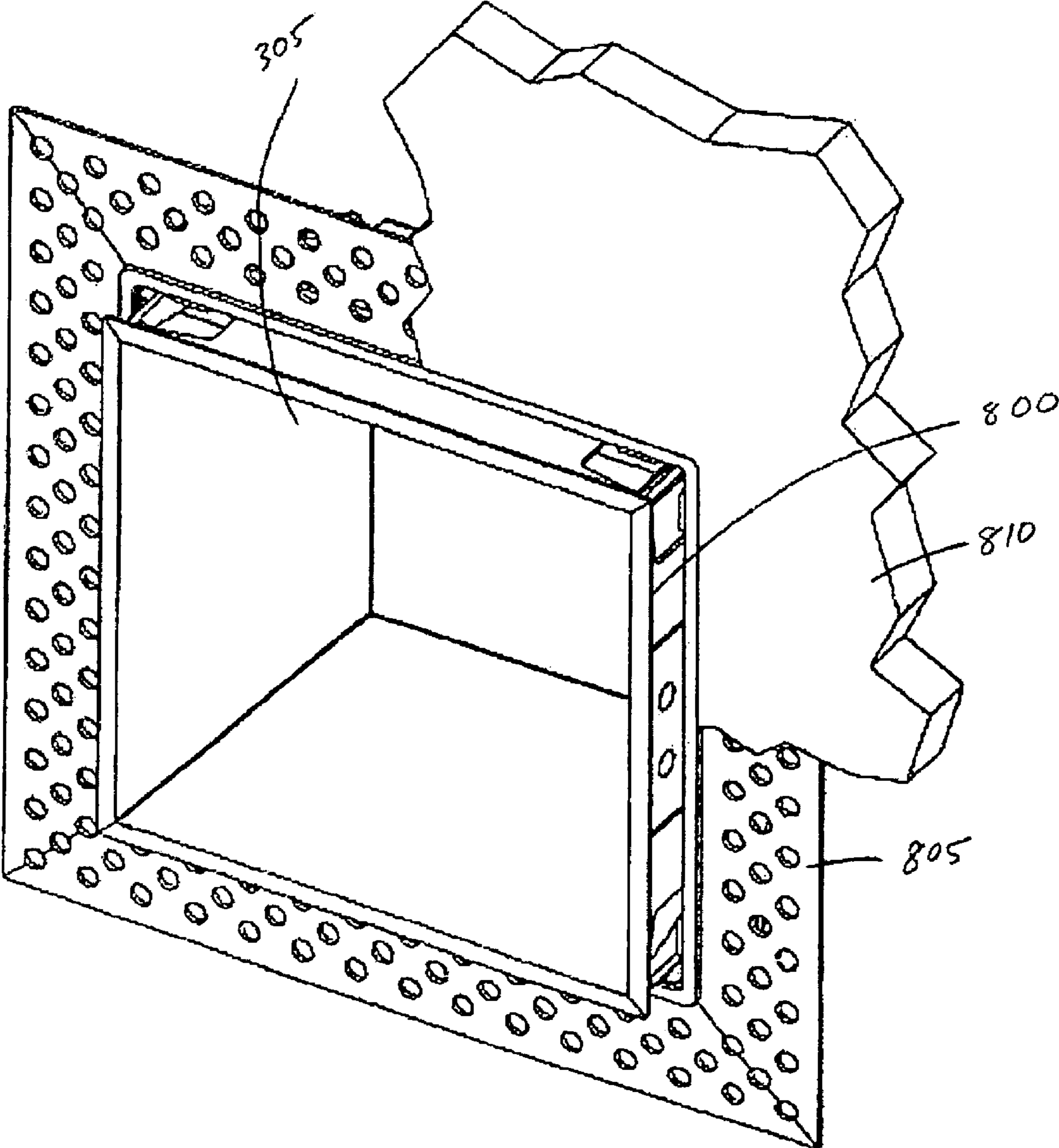


Fig. 8

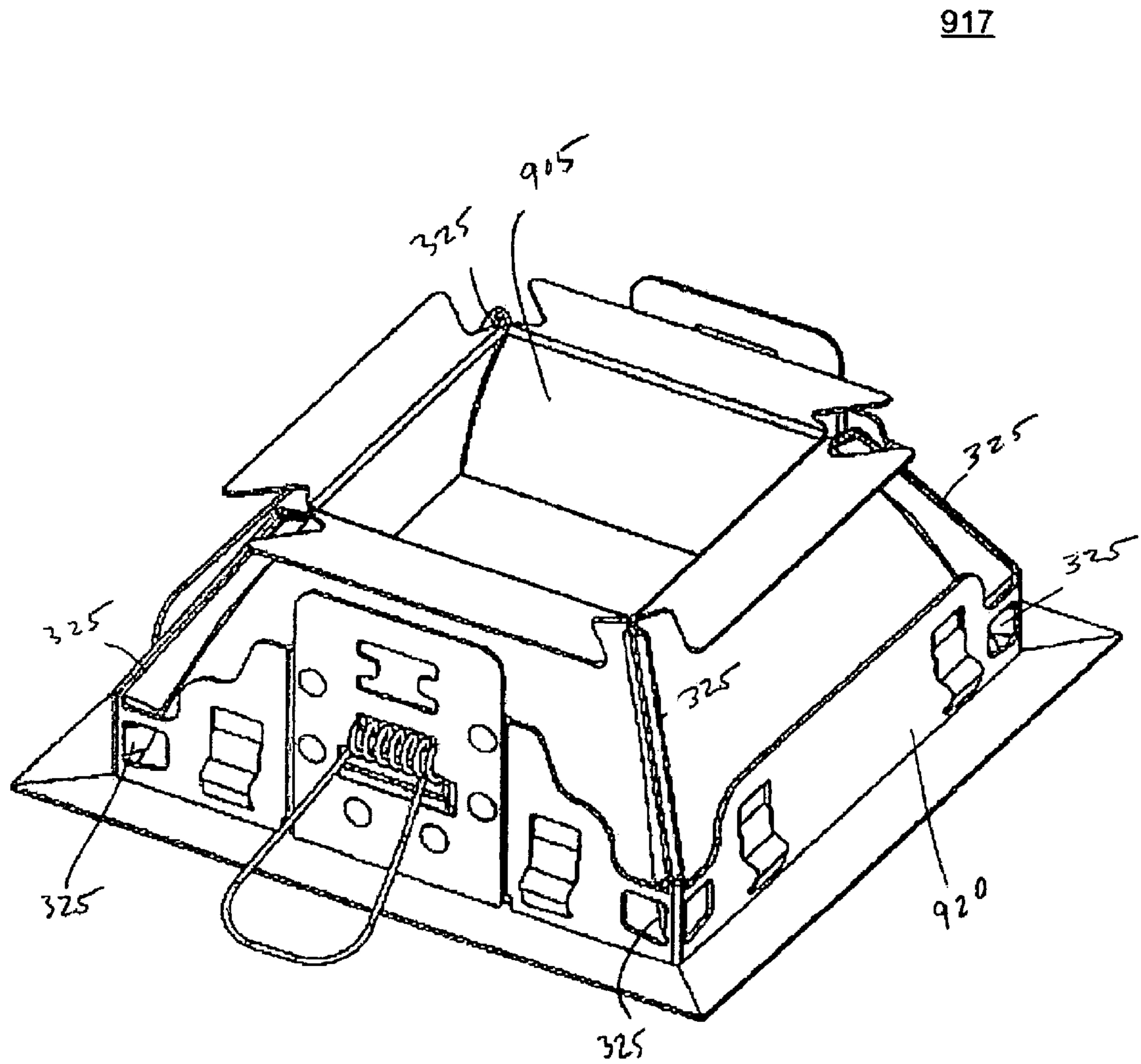
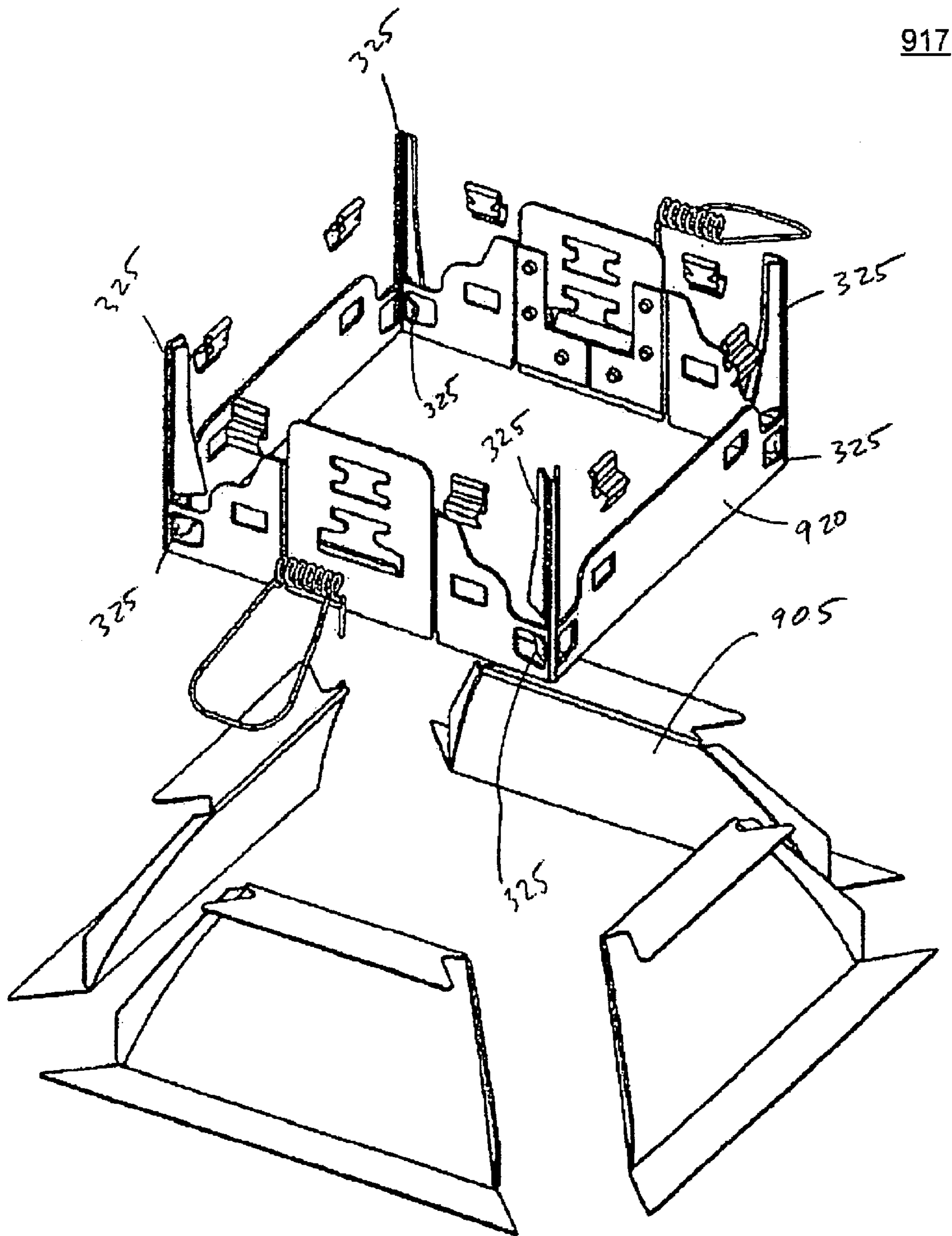


Fig. 9



917

Fig. 10

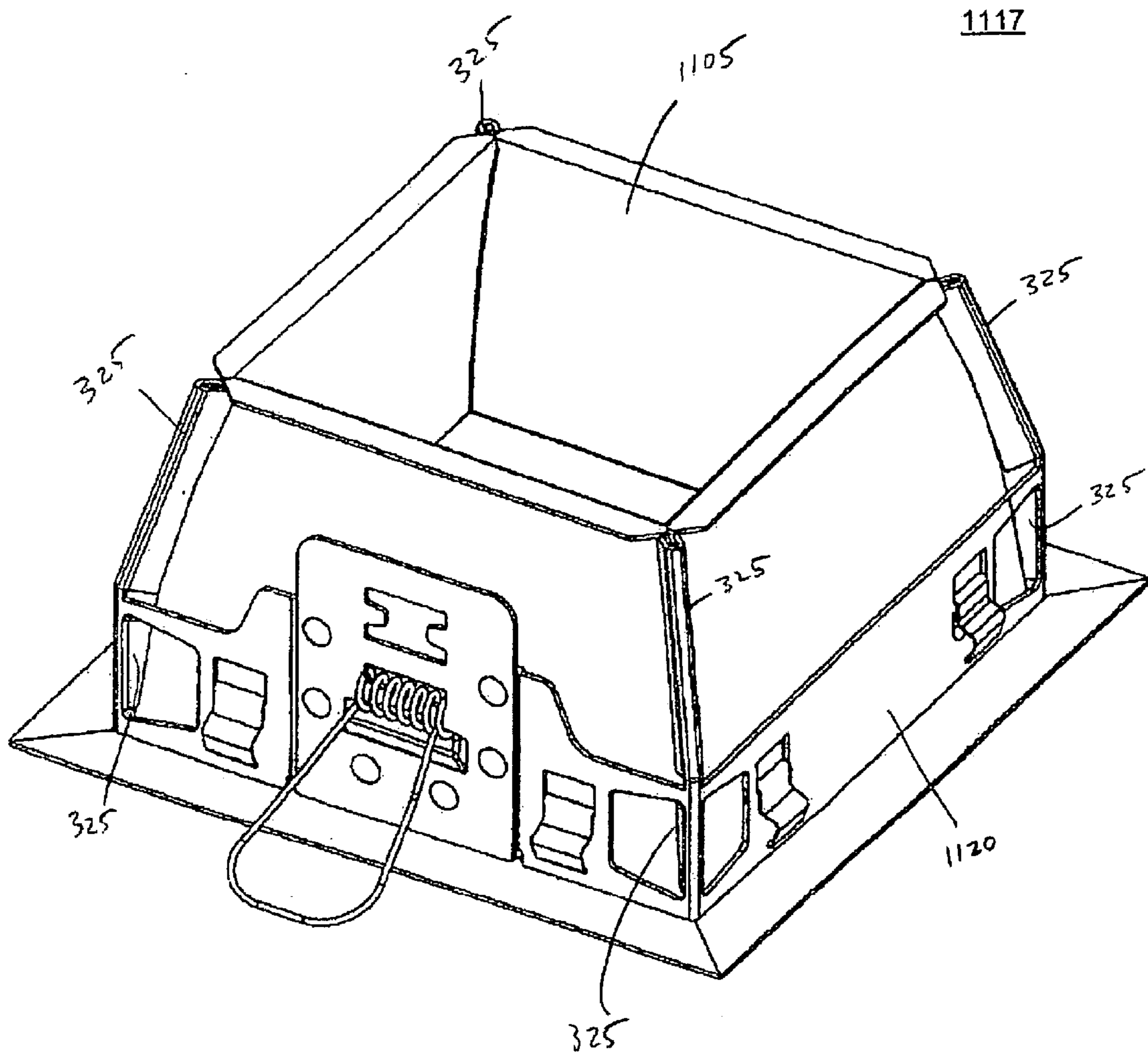


Fig. 11

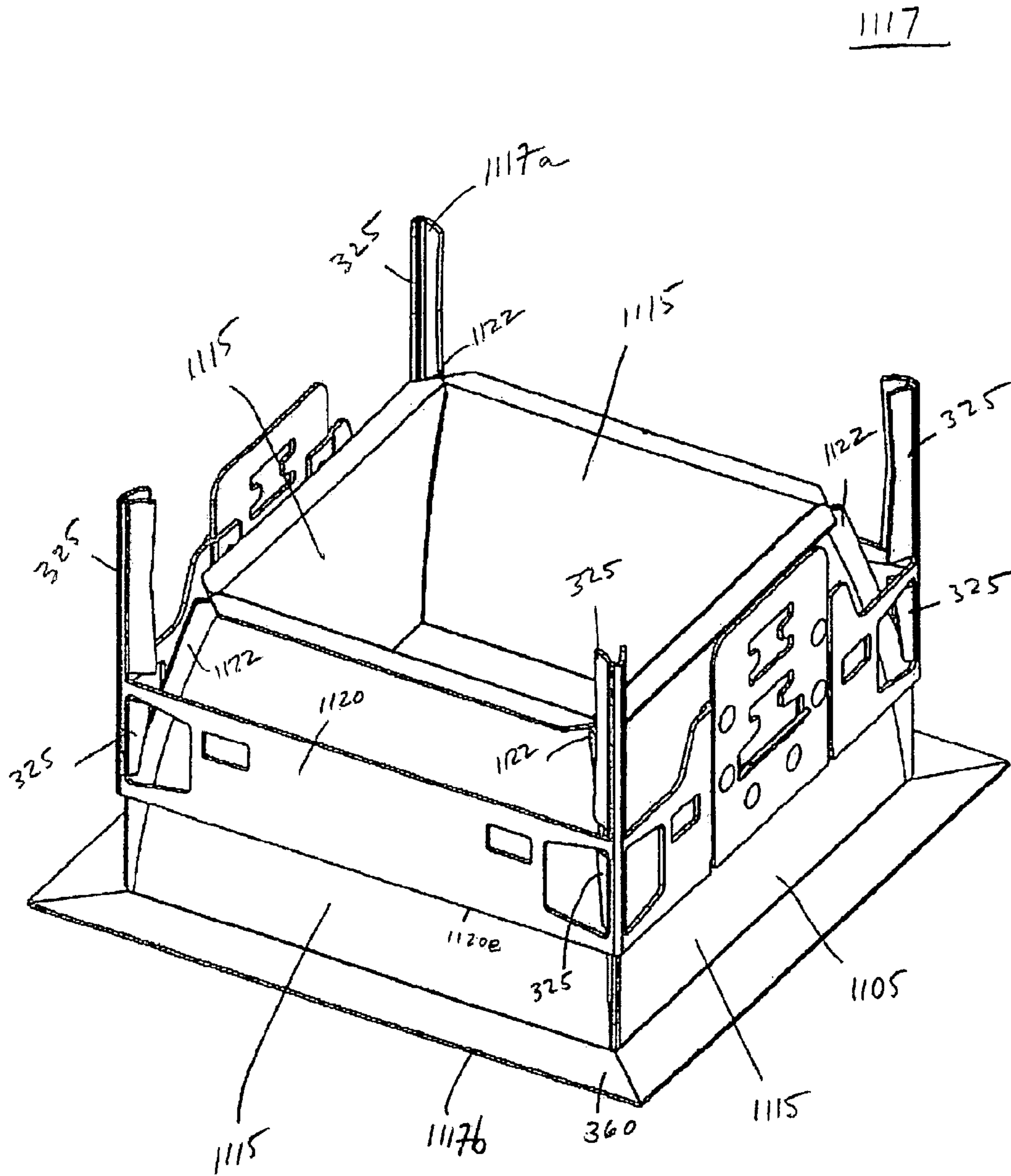


Fig. 12

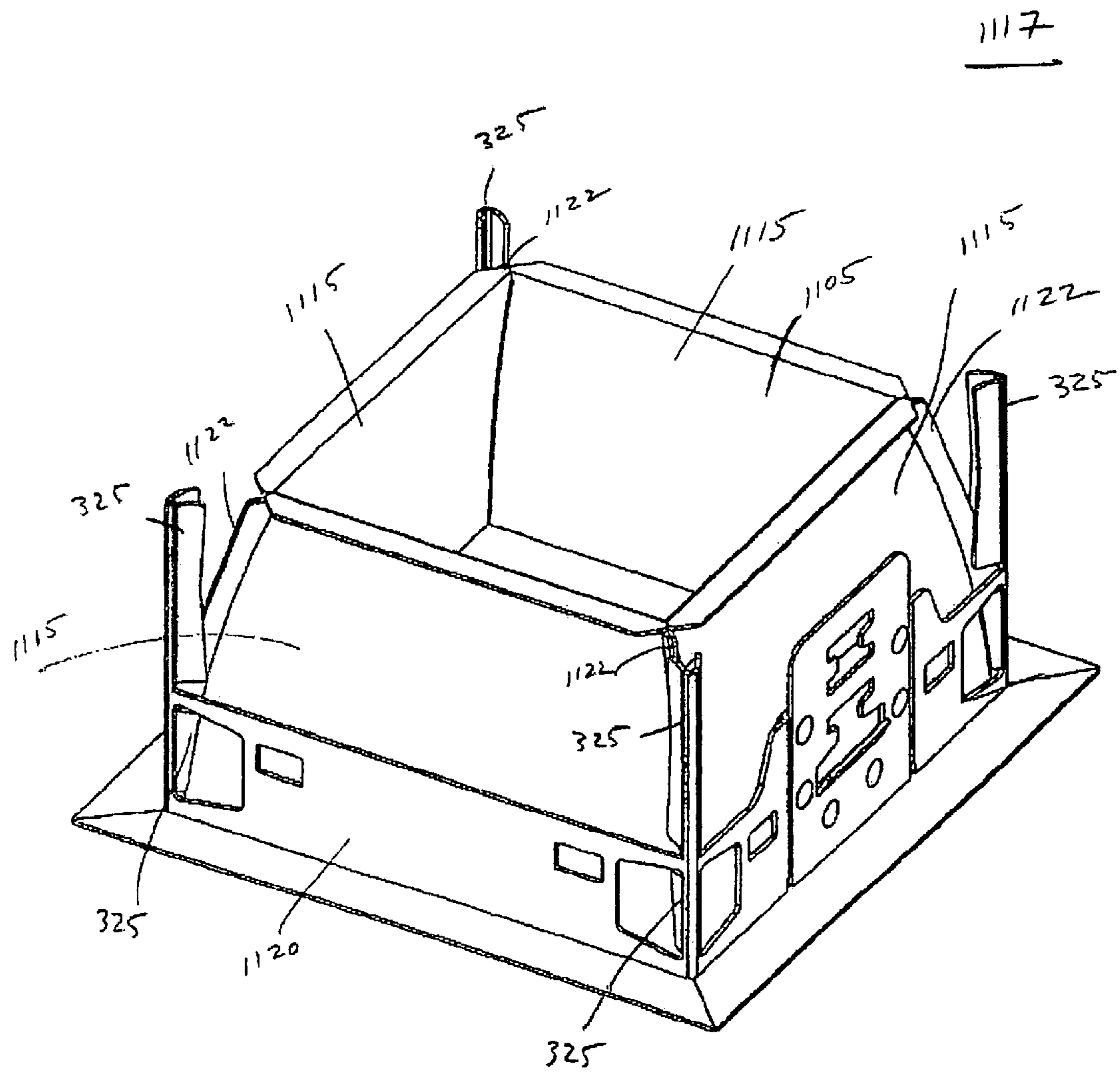


Fig. 13

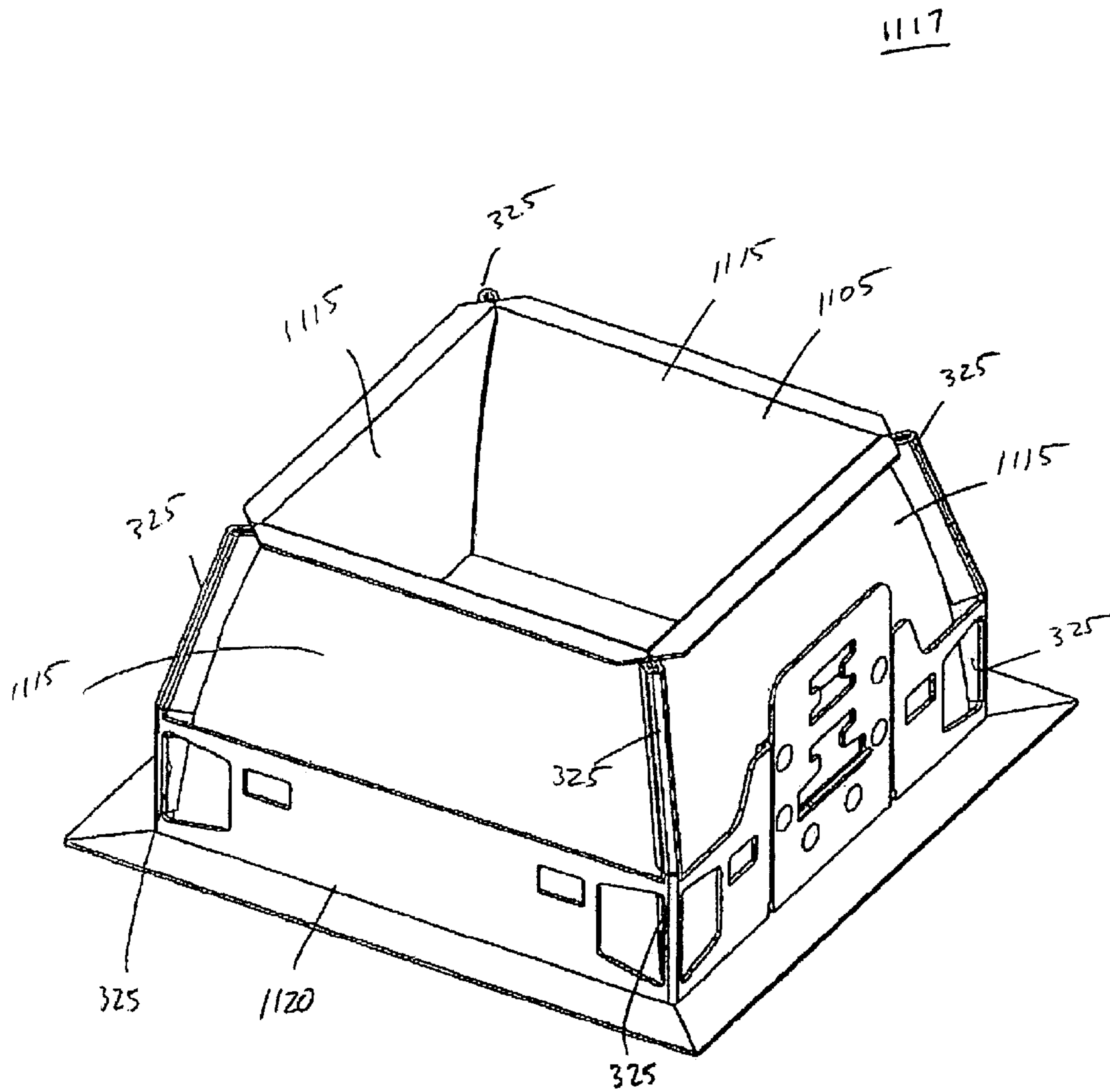


Fig. 14

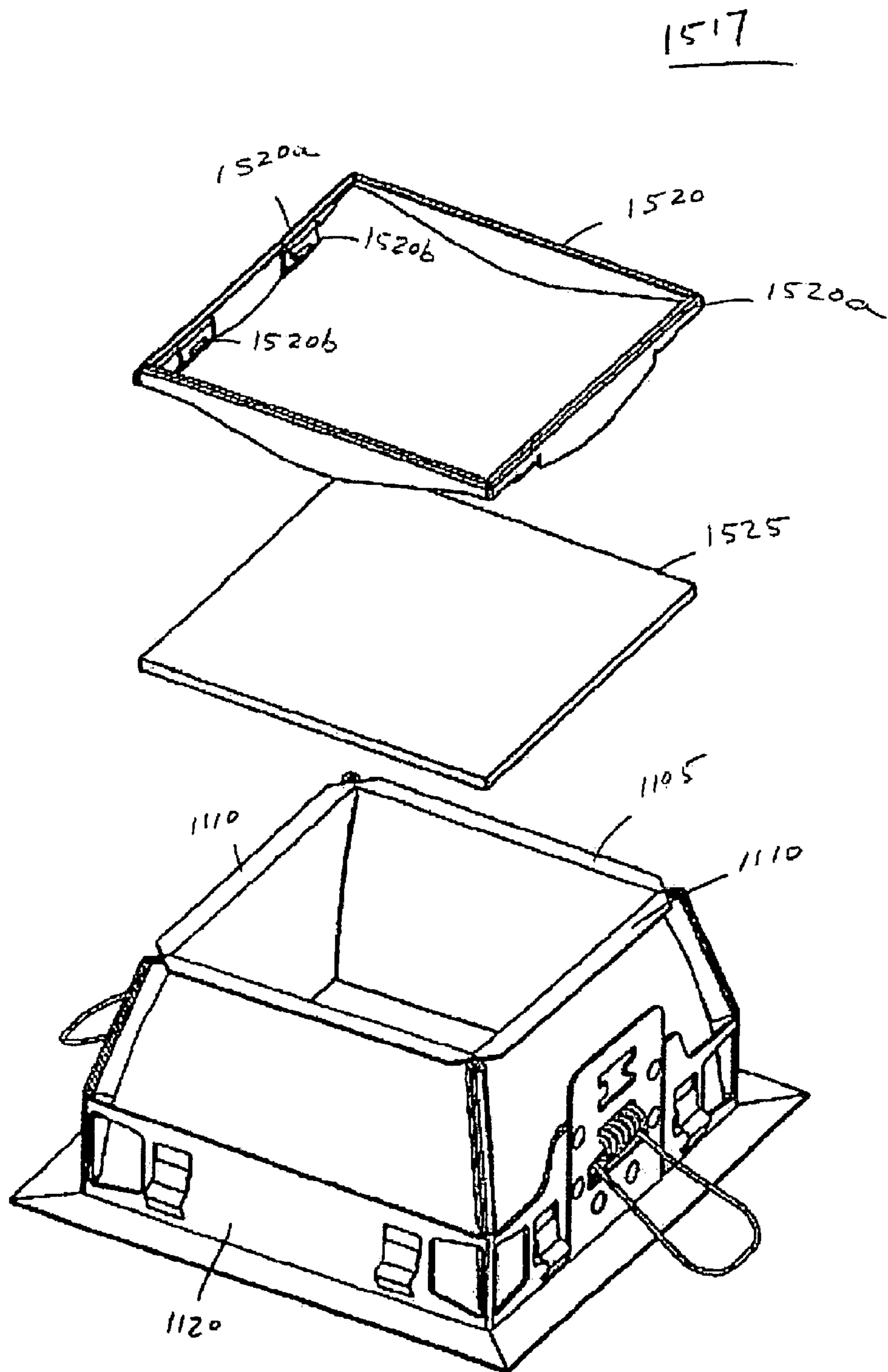


Fig. 15

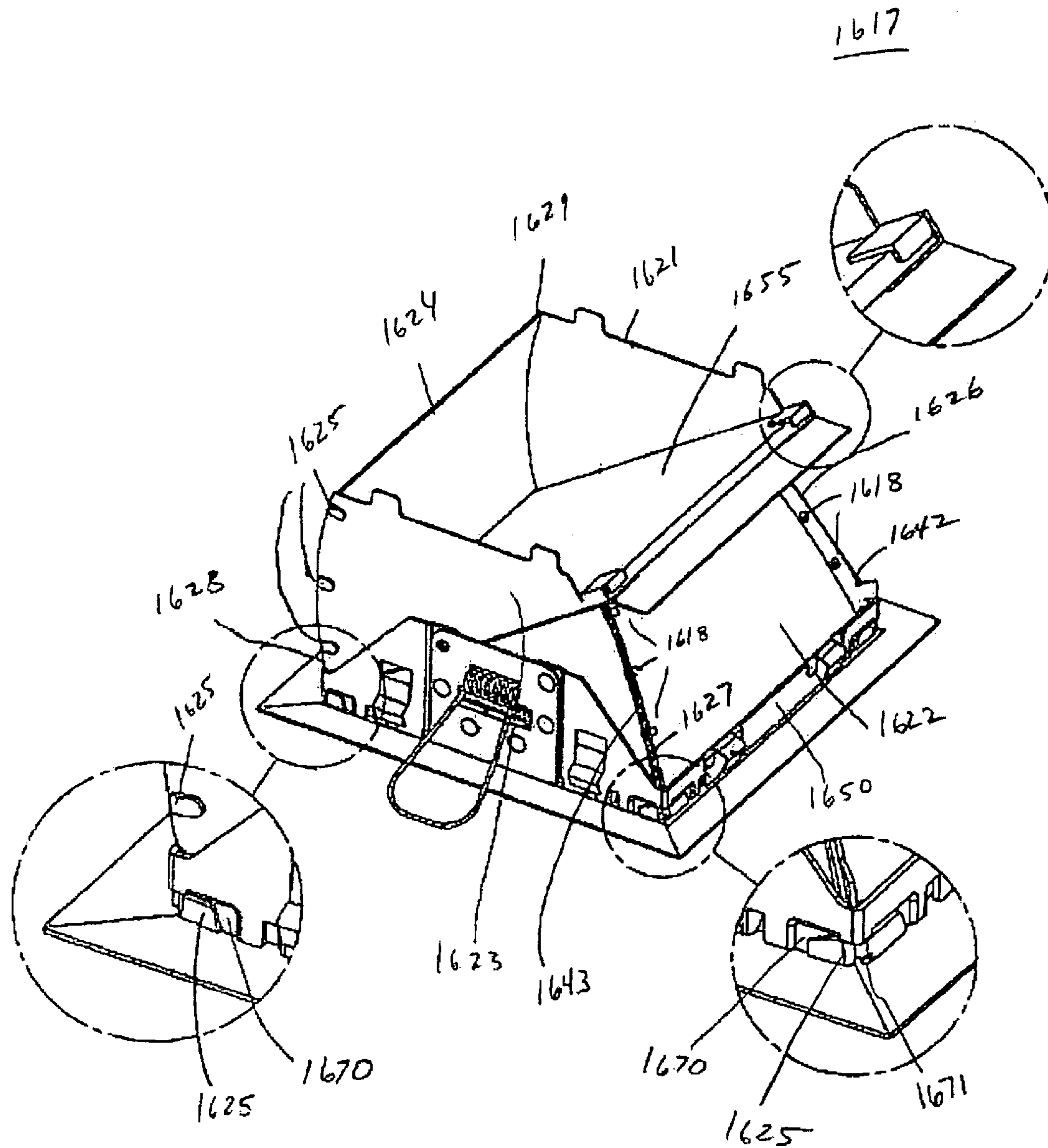


Fig. 16

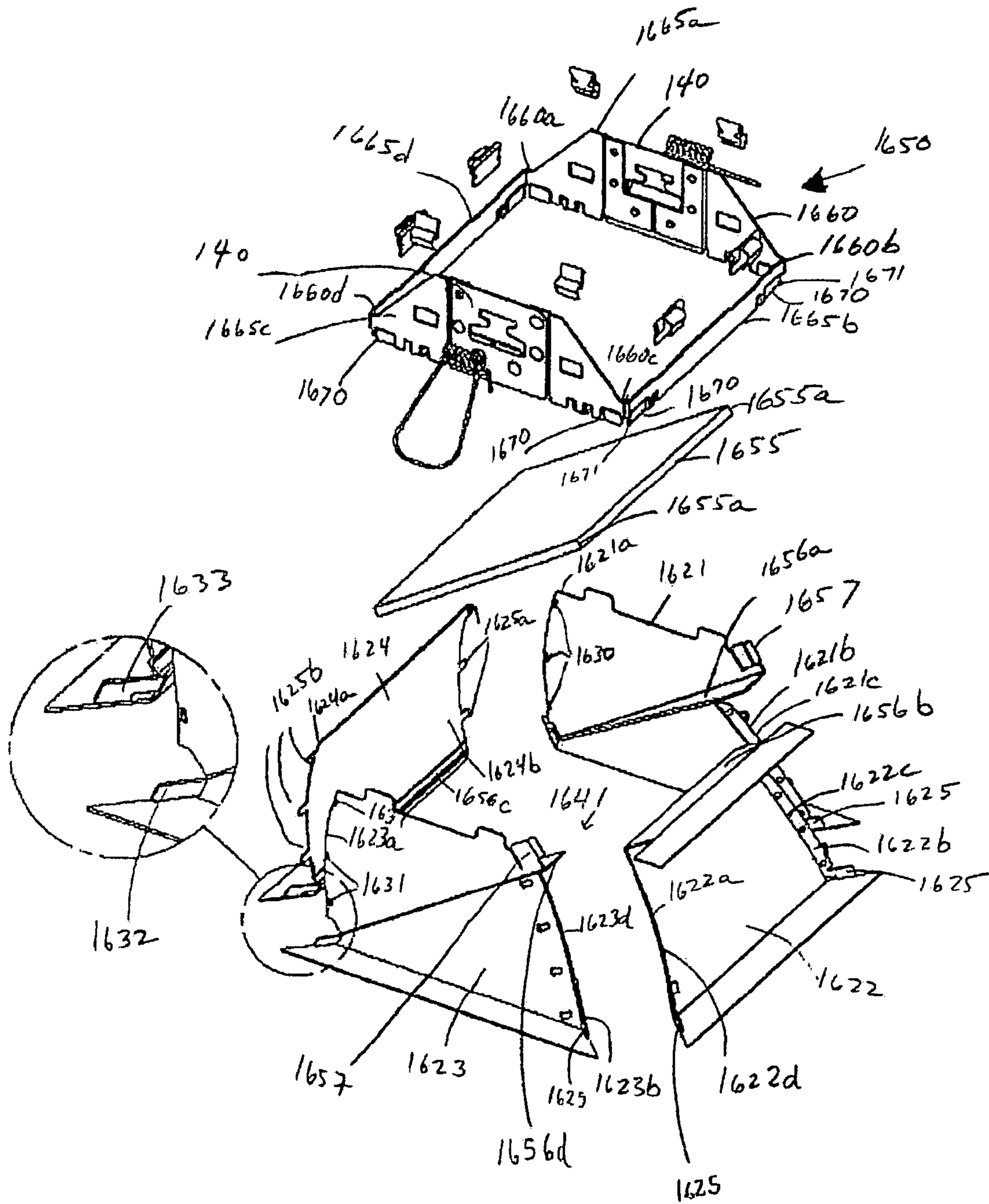


Fig. 17

REFLECTOR ASSEMBLY FOR A RECESSED LUMINAIRE

RELATED APPLICATION

This application is a continuation of U.S. patent application Ser. No. 12/114,969, titled "Reflector Assembly for a Recessed Luminaire," filed on May 5, 2008, now U.S. Pat. No. 7,784,979 which is related to co-pending U.S. patent application Ser. No. 11/809,785, titled "Surface-Mounted Lighting Fixture," filed Jun. 1, 2007. The complete disclosures of each of the foregoing related applications are hereby fully incorporated herein by reference.

TECHNICAL FIELD

The invention relates generally to recessed luminaires, and more particularly, to maintaining the integrity and shape of a multi-member reflector of a recessed luminaire.

BACKGROUND

A luminaire is a system for producing, controlling, and/or distributing light for illumination. For example, a luminaire can include a system that outputs or distributes light into an environment, thereby allowing certain items in that environment to be visible. Luminaires are sometimes referred to as "light fixtures".

A recessed lighting fixture is a light fixture that is installed in a hollow opening in a ceiling or other surface. A typical recessed lighting fixture includes a platform attached to a ceiling or wall structure, a reflector mounted to the platform, and a lamp socket coupled to the reflector. For example, the lamp socket can be mounted directly to the reflector and/or platform. Alternatively, the lamp socket can be mounted to an upper reflector, which can be mounted to the reflector and/or platform. The lamp socket is configured to receive a light-emitting element, such as a lamp, light-emitting diode (LED), or bulb. For simplicity, the term "lamp" is used herein to refer to any light-emitting element.

The reflector can include a single member or multiple members that are joined together at one or more joints. For example, the joints can be riveted or spot welded together. Riveting, spot welding, and other traditional methods of joining members of a multi-member reflector are unsatisfactory. Such methods typically result in poor structural integrity of the reflector. For example, traditional multi-member reflectors include one or more gaps at the joints of the members. These gaps can allow light to leak between the members, decreasing the efficiency and aesthetic value of the lighting fixture. In addition, the gaps can compromise the geometry of the reflectors. For example, large gaps can cause a "square"-shaped reflector to have a non-square geometry, thereby changing the intended effect of the reflector to the light from the light-emitting element. Moreover, spot welding may cause deformation or degradation of a surface of the reflector.

Therefore, a need exists in the art for a system and method for maintaining the integrity and shape of a reflector of a recessed luminaire. In particular, a need exists in the art for maintaining the integrity and shape of a multi-member reflector of a recessed luminaire.

SUMMARY

The invention provides a system and method for maintaining the integrity and shape of a multi-member reflector for a recessed luminaire. In particular, the invention provides a

reflector assembly having a frame configured to maintain the integrity and shape of the multi-member reflector of the reflector assembly. The members of the reflector can be arranged in a geometric form, such as an oblong, oval, rectangular, circular, hexagonal, triangular, or any other geometric form.

The frame can be disposed around all or a portion of the reflector and can include one or more integral members configured to be manipulated around joints formed between adjacent members of the reflector. For example, each integral member can include a protrusion from an edge of the reflector, such as a clamp or a tab. Alternatively, the members of the reflector can include one or more integral tabs configured to be manipulated around the joints. For example, each integral tab can include a protrusion from an edge of the reflector member, which may be manipulated around an outside edge of the frame. The frame and the integral member(s) can be configured to secure the positions of the members relative to one another and to prevent light from leaking through joints between each of the members.

One or more connectors can be integral to the frame or coupled to the frame for connecting the reflector assembly to a lighting fixture. For example, each connector can include a biasing member, such as a torsion spring, that includes a lever. The lever can be configured to engage a corresponding catch of a collar on the lighting fixture.

These and other aspects, features and embodiments of the invention will become apparent to a person of ordinary skill in the art upon consideration of the following detailed description of illustrated embodiments exemplifying the best mode for carrying out the invention as presently perceived.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and the advantages thereof, reference is now made to the following description, in conjunction with the accompanying figures briefly described as follows.

FIG. 1 is an elevational cross-sectional side view of a lighting fixture, in accordance with certain exemplary embodiments.

FIG. 2 is a perspective top view of a platform of the lighting fixture of FIG. 1, in accordance with certain exemplary embodiments.

FIG. 3 is a perspective side view of a reflector assembly of the lighting fixture of FIG. 1, in accordance with certain exemplary embodiments.

FIG. 4 is an elevational side view of a connector of the reflector assembly of FIG. 3, in accordance with certain exemplary embodiments.

FIG. 5 is a perspective side view of the connector of FIG. 4, in accordance with certain exemplary embodiments.

FIG. 6 is an elevational side view of the connector of FIG. 4, in accordance with certain exemplary embodiments.

FIG. 7 is a perspective side view of the connector of FIG. 4, in accordance with certain exemplary embodiments.

FIG. 8 is a perspective side view of a trim-less application of the reflector assembly of FIG. 3, in accordance with certain alternative exemplary embodiments.

FIG. 9 is a perspective side view of another reflector assembly, in accordance with certain alternative exemplary embodiments.

FIG. 10 is a perspective exploded side view of the alternative reflector assembly of FIG. 9, in accordance with certain alternative exemplary embodiments.

FIG. 11 is a perspective side view of yet another reflector assembly, in accordance with certain alternative exemplary embodiments.

FIG. 12 is a perspective side view of the alternative reflector assembly of FIG. 11, during a first stage of assembly thereof, in accordance with certain exemplary embodiments.

FIG. 13 is a perspective side view of the alternative reflector assembly of FIG. 11, during a second stage of assembly thereof, in accordance with certain exemplary embodiments.

FIG. 14 is a perspective side view of the alternative reflector assembly of FIG. 11, in an assembled state, in accordance with certain exemplary embodiments.

FIG. 15 is a perspective, partially exploded, side view of yet another reflector assembly, in accordance with certain alternative exemplary embodiments.

FIG. 16 is a perspective side view of yet another reflector assembly, in accordance with certain alternative exemplary embodiments.

FIG. 17 is a perspective, exploded view of the alternative reflector assembly of FIG. 16, in accordance with certain exemplary embodiments.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

The following description of exemplary embodiments refers to the attached drawings, in which like numerals indicate like elements throughout the several figures.

FIG. 1 is an elevational cross-sectional side view of a lighting fixture 100, in accordance with certain exemplary embodiments. The lighting fixture 100 includes a platform 105, a housing 110, a lamp 115, a reflector assembly 117, and one or more hanger bars 120 configured to be installed in a hollow opening in a ceiling (not shown) or other surface (not shown). For example, the lighting fixture 100 may be installed overhead, with a substantial portion of the lighting fixture 100 being disposed within a ceiling of a house, an office building, or like structure.

Each hanger bar 120 is configured to be fastened to a ceiling or wall support or joist. In certain exemplary embodiments, each hanger bar 120 can include an integral fastener for attaching the hanger bar 120 to the support or joist, substantially as described in co-pending U.S. patent application Ser. No. 10/090,654, entitled "Hanger Bar for Recessed Luminaires with Integral Nail," the complete disclosure of which is hereby fully incorporated herein by reference. The platform 105 extends substantially between the hanger bars 110.

FIG. 2 is a perspective top view of the platform 105, in accordance with certain exemplary embodiments. With reference to FIGS. 1 and 2, the platform 105 includes a generally rectangular, flat plate 105a with upturned edges 105b. The flat plate 105a can be constructed from any material, including, but not limited to, a galvanized plaster steel.

The platform 105 includes an aperture 125 through which light from the lamp 115 can pass. Although depicted in FIGS. 1 and 2 to have a square form, the aperture 125 can have any geometric form, including, but not limited to, an oblong, oval, rectangular, circular, hexagonal, triangular, or other geometric form. A collar 130 frames at least a portion of the aperture 125. In certain exemplary embodiments, the collar 130 includes one or more members extending substantially perpendicularly from the flat plate 105a, around the aperture 125. For example, when the lighting fixture 100 (FIG. 1) is installed in a ceiling, the collar 130 may extend upward, into the ceiling.

The collar 130 includes one or more catches 135 configured to engage corresponding connectors 140 of FIG. 3 on the reflector assembly 117. The reflector assembly 117 is configured to direct, enhance, and focus light from the lamp 115 through the aperture 125. Typically, the reflector assembly 117 has a profile that corresponds to the geometric form of the aperture 125. For example, a person can install the reflector assembly 117 in the lighting fixture 100 by sliding a top end 117a of the reflector assembly 117 into the aperture 125 and securing each connector 140 (of FIG. 3) to its corresponding catch 135. The reflector assembly 117 is described in greater detail hereinafter with reference to FIG. 3.

FIG. 3 is a perspective side view of the reflector assembly 117, in accordance with certain exemplary embodiments. The reflector assembly 117 includes a reflector 305 and a bracket assembly 310 disposed substantially about the reflector 305. The reflector 305 includes multiple members 315 joined together at joints 316-319.

Each of the members 315 comprises a reflective material, such as extruded metal, sheet metal, or die-cast metal. In certain exemplary embodiments, one or more of the members 315 can include a protective coating, such as an anodized layer of material. Each member 315 includes a first end segment 315a and a second end segment 315b disposed on opposing sides of a central segment 315c. The first end segment 315a of one member is positioned substantially adjacent to the second end segment 315b of another member 315, converging at the joints 316-319.

The members 315 are disposed around a light dispersion region 321. One side of each central segment 315c is visible from within the light dispersion region 321. Each end segment 315a and 315b extends from its corresponding central segment 315, in a direction away from the light dispersion region 321. Thus, each pair of the end segments 315a and 315b essentially creates a "wing" 322a-322d that extends outward from the light dispersion region 321 and generally towards the bracket assembly 310. The end segments 315a and 315b and their corresponding wings 322a-322d are generally not visible from within the light dispersion region 321.

The bracket assembly 310 includes a frame 320 and the connectors 140. The frame 320 can be formed as a single member, with no joints, or by joining together multiple members at one or more joints. The frame 320 includes side segments 355b-355d disposed about at least a portion of the members 315 of the reflector 305. Each corner 320b-320d of the frame 320 includes at least one clamp 325 configured to be compressed around at least a portion of a corresponding one of the wings 322a-322d. For example, each clamp 325 can include a substantially "V"-shaped member configured to be compressed around its corresponding portion of a wing 322a-322d. In certain exemplary embodiments, the clamp 325 is integral with its corresponding corner 320b-320d.

In addition to securing the bracket assembly 310 to the reflector 305, the clamps 325 and the segments 355b-355d provide structural integrity to the reflector 305. For example, the clamps 325 and the segments 355b-355d secure the end segments 315a and 315b at the joints 322a-322d of the reflector 305, thereby maintaining a geometrical relationship between the members 315. In addition, the clamps 325 prevent light from leaking out from the light dispersion region 321 along the joints 322a-322d. For example, by providing clamps 325a and 325d that extend along a significant portion of the joint 322a-322d, the clamps 325a and 325d can prevent gaps between the members 315 and also can reflect light transmitted through any such gaps back into the light dispersion region 321.

Each connector **140** includes a biasing member, such as a torsion spring **345**, having a lever **350**. FIGS. 4-7 illustrate the connector **140**, in accordance with certain exemplary embodiments. With reference to FIGS. 4-7, the connector **140** includes a generally elongated body member **405** having a top end **405a** and a bottom end **405b**. Two apertures **406** and **407** are disposed within the body member **405**, with mounting tabs **408** and **409** being disposed on opposite sides of each aperture **406** and **407**. The aperture **406** is disposed proximate the top end **405a** of the body member **405**, and the aperture **407** is disposed proximate the bottom end **405b** of the body member **405**.

The torsion spring **345** can be installed within one of the apertures **406** and **407**. Ends of the torsion spring **345** can be disposed about the mounting tabs **408** and **409**. For example, the torsion spring **345** can be installed within the aperture **406** when the lighting fixture **100** of FIG. 1 is installed in a relatively thick ceiling. Similarly, the torsion spring **345** can be installed within the aperture **407** when the lighting fixture **100** is installed in a ceiling having an average thickness. While the exemplary embodiment depicted in FIGS. 4-7 includes two apertures **406** and **407** in the body member **405**, the body member **405** can include one or more apertures or the torsion spring **345** can be coupled to the body member **405** by other means known in the art.

With reference to FIGS. 3-7, actuation of the lever **350** relative to the reflector **305** can energize the torsion spring **345**. For example, actuation of the lever **350** upwards, so that an end **350a** of the lever **350** moves towards the top end of the reflector assembly **117a** can energize the torsion spring **345**. Similar actuation of the lever **350** in the opposite direction can release energy within the torsion spring **345**. In certain exemplary embodiments, a resting tab **410** extends angularly from the body member **405** of the connector **140**. The resting tab **410** is configured to prevent the lever **350** of the torsion spring **345** from impacting a flange **360** of the reflector **305**. For example, the flange **360** can include a trim of the lighting fixture **100** of FIG. 1.

In certain alternative exemplary embodiments, one or more of the connectors **140** can be integral to the frame **320**. For example, apertures **406** and **407** of the connectors **140** can be formed in side members of the frame **320** such that each biasing member **345** of the connectors **140** extends between mounting tabs integral to the frame **320**. Each of the connectors **140** may include a resting tab integral to the frame **320**, similar to the resting tab **410** described above. In additional alternative exemplary embodiments, the reflector assembly **117** may not include connectors **140**.

With reference to FIGS. 1-3, an operator can install the reflector assembly **117** within the lighting fixture **100** by sliding the top end **117a** of the reflector assembly **117** into the aperture **125** and securing each connector **140** to its corresponding catch **135**. Specifically, the operator can actuate each lever **350** upwards to energize its corresponding torsion spring **345**. Once the reflector assembly **117** is positioned correctly within the aperture **125**, the operator can mount the reflector assembly **117** within the lighting fixture **100** by releasing the levers **350**. This releasing movement can cause the torsion springs **345** to actuate the levers **350** downward, such that each lever **350** engages its corresponding catch **135**. For example, each catch **135** can include a notch (not shown) configured to receive at least a portion of the end **350a** of the corresponding lever **350**.

In certain exemplary embodiments, adjustment tabs **365** disposed about the frame **320** can help ensure proper alignment of the reflector assembly **117** within the lighting fixture **100**. For example, each adjustment tab **365** can include a clip,

as illustrated in FIG. 3. Each adjustment tab **365** is configured to engage a corresponding notch **170** in the collar **130** of the platform **105** of the lighting fixture.

Although FIG. 3 illustrates two adjustment tabs **365** disposed on each side of the frame **320**, a person of ordinary skill in the art having the benefit of the present disclosure will recognize that any number of adjustment tabs **365** may be utilized on one or more sides of the frame **320** in certain alternative embodiments. Similarly, sizing, configuration, and position of each adjustment tab **365** can vary depending on the lighting application. For example, if the reflector assembly **117** includes a metal trim, such as a die-cast metal trim, the metal trim can include one or more vertical protrusions instead of the clips **365** depicted in FIG. 3. Similarly, as illustrated in FIG. 8, the adjustment tabs **365** may not be included within the frame **320** in a trim-less application of the reflector assembly **117**. For example, instead of adjustment tabs **365**, the trim-less application can nest a lip **800** of the reflector **305** into a rimless frame **805** bonded with ceiling finishing material **810**. In this alternative exemplary embodiment, the ceiling finishing material **810** can maintain alignment of the reflector assembly **117**.

Although illustrated in FIG. 3 as having an “angle cut” geometry, the reflector **305** may have one of many other suitable geometries in certain alternative exemplary embodiments. For example, FIGS. 9 and 10 illustrate a reflector assembly **917** with a reflector **905** having a “short square” geometry, according to certain alternative exemplary embodiments. Similarly, FIG. 11 illustrates a reflector assembly **1117** with a reflector **1105** having a “tall square” geometry, according to certain alternative exemplary embodiments. Aside from the different geometries of the reflectors **905** and **1105** in these reflector assemblies **917** and **1117**, respectively, the reflector assemblies **917** and **1117** are substantially identical to the reflector assembly **117** (of FIG. 3) described previously. Integral clamps **325** of frames **920** and **1120** of the reflector assemblies **917** and **1117**, respectively, may have different sizes and configurations than the integral clamps **325** of the reflector assembly **117**, to accommodate the different geometries of the reflector assemblies **917** and **1117**.

FIGS. 12-14 illustrate a method of manufacturing the reflector assembly **1117**, in accordance with certain exemplary embodiments. Referring to FIGS. 12-14, the members **1115** of the reflector **1105** of the reflector assembly **1117** are aligned with one another so that a proper geometrical relationship exists between the members **1115**. For example, in certain exemplary embodiments, the geometric relationship can be a square that is made up of four members **1115**. In certain exemplary embodiments, the members **1115** may include a protective coating, such as an anodized layer of material. For example, the protective coating may be applied to the members **1115** before the members **1115** are aligned for assembly.

As illustrated in FIG. 12, the frame **1120** of the reflector assembly **1117** is aligned with the members **1115**. For example, the frame **1120** can slide around the members **1115**, from a top end **1117a** of the reflector assembly **1117** towards a bottom end **1117b** of the reflector assembly **1117b**. In certain exemplary embodiments, the frame **1120** rests proximate the bottom end **1117b** of the reflector assembly **1117**, with a bottom edge **1120e** of the frame **1120** being disposed proximate a flange **360** of the reflector **1105**, as illustrated in FIG. 13. The frame **1120** is secured to the reflector **1105** by compressing each of one or more integral clamps **325** of the frame **1120** around at least a portion of a corresponding wing **1122** (of FIGS. 12 and 13) of the reflector **1105**, as illustrated in

FIG. 14. Although the method associated with FIGS. 12-14 relates to a reflector assembly 1117 having a tall square geometry, a person of ordinary skill in the art having the benefit of the present disclosure will recognize that the method may be used to assemble assemblies having other shapes, such as the assemblies 117 and 917 described previously.

FIG. 15 is a perspective exploded view of a reflector assembly 1517, in accordance with certain alternative exemplary embodiments. The reflector assembly 1517 includes a reflector 1105 and a frame 1120 that are substantially identical to the reflector 1105 and frame 1120, respectively, of the reflector assembly 1117 of FIG. 11. In addition, the reflector assembly 1517 includes a lens frame 1520 and lens 1525. Edges 1520a of the lens frame 1520 include one or more clips 1520b configured to engage corresponding tabs 1110 disposed proximate a top end of the reflector 1105. For example, the exemplary lens frame 1520 can be configured to be removably coupled to the reflector 1105 by way of the clips 1520b and tabs 1110.

The lens 1525 includes a transparent or semi-transparent member having a profile that substantially corresponds to an interior profile of the lens frame 1520. In certain exemplary embodiments, the lens 1525 may be installed in the reflector assembly 1517 by placing the lens 1525 on the top end of the reflector 1105, aligning the lens frame 1520 with the lens 1525 and the reflector 1105, and securing the clips 1520b of the lens frame 1520 to the tabs 1110 of the reflector 1105. In certain exemplary embodiments, the lens 1525 is configured to protect a lamp (not shown) or wiring (not shown) associated with the lighting fixture 100 (of FIG. 1) from damage due to environmental or other conditions, such as preventing water from contacting the lamp or wiring.

Although FIG. 15 depicts the lens frame 1520 and lens 1525 with a reflector 1105 having a tall square geometry, the lens frame 1520 and lens 1525 may be used with other reflectors (not shown) having other geometries. For example, each of the angle-cut reflector assembly 117 of FIG. 3 and the short square reflector assembly 917 of FIGS. 9 and 10 may be configured to include a lens frame 1520 and lens 1525, substantially as described previously in connection with the reflector assembly 1517 of FIG. 15.

FIGS. 16 and 17 illustrate a reflector assembly 1617, in accordance with certain alternative exemplary embodiments. With reference to FIGS. 16-17, the reflector assembly 1617 is similar to the reflector assembly 117 of FIG. 3, except that the reflector assembly 1617 has a different geometric shape than the reflector assembly 117 of FIG. 3 and includes fasteners 1618 and integral tabs 1625 in place of the integral clamps 325 (of FIG. 3) of the reflector assembly 117. The reflector assembly 117 of FIG. 3 is generally referred to as a “down-light” reflector assembly, and the reflector assembly 1617 is generally referred to as a “wall-wash” reflector assembly 1617.

Like the reflector assembly 117 of FIG. 3, the reflector assembly 1617 includes multiple members 1621-1624 coupled to one another at joints 1626-1629. A bracket assembly 1650 is disposed substantially around at least a portion of each member 1621-1624. As best seen in FIG. 17, member 1621 has a first end 1621a and a second end 1621b. The first end 1621a includes notches 1630 configured to receive tabs 1625a disposed on a second end 1624b of member 1624. For example, when the reflector assembly 1617 is assembled, the tabs 1625a are bent around the edges of the notches 1630 to secure the members 1621 and 1624 to one another.

The second end 1621b of the member 1621 includes a segment 1621c that extends in a direction away from a light dispersion region 1641 of the reflector assembly 1617. Simi-

larly, a second end 1622b of the member 1622 includes a segment 1622c that extends in a direction away from the light dispersion region 1641. The segments 1621c and 1622c engage one another, with fasteners 1618 (FIG. 16) securing the segments 1621c and 1622c together. The segments 1621c and 1622c essentially create a “wing” 1642 that extends away from the light dispersion region 1641, towards the bracket assembly 1650. For example, fasteners 1618 can extend through aligned apertures in the segments 1621c and 1622c to secure the segments 1621c and 1622c together. In certain exemplary embodiments, the fasteners 1618 include, but are not limited to pins, clips, screws, bolts, nails, rivets, or other means for fastening known in the art.

As best seen in FIG. 17, a similar arrangement exists between a first end 1622a of the member 1622 and a second end 1623b of the member 1623. Specifically, the first end 1622a includes a segment 1622d that extends in a direction away from the light dispersion region 1641, and the second end 1623b includes a segment 1623d that extends in a direction away from the light dispersion region 1641. The segments 1622d and 1623d essentially create a “wing” 1643 that extends away from the light dispersion region 1641 and generally towards the bracket assembly 1650. For example, fasteners 1618 can extend through aligned apertures in the segments 1622d and 1623d to secure the segments 1622d and 1623d together.

Similar to the first end 1621a of the member 1621, a first end 1623a of the member 1623 includes notches 1631 configured to receive tabs 1625b disposed on a first end 1624a of the member 1624. For example, when the reflector assembly 1617 is assembled, the tabs 1625b are bent around edges of the notches 1631 to secure the members 1623 and 1624 to one another. In certain exemplary embodiments, one or more of the members 1621-1624 may include an integral corner tab 1632 configured to engage a corresponding notch 1633 of an adjacent member 1621-1624. For example, in certain exemplary embodiments, the corner tab 1632 is configured to be bent into the notch 1633 to secure the adjacent members 1623 and 1624 together.

A lens 1655 is positioned with the reflector 1605 by resting on support segments 1656a-1656d of the members 1621-1624. The lens 1655 includes a transparent or semi-transparent member. Integral tabs 1657 of the members 1621 and 1623 are configured to bend around corner edges 1655a of the lens 1655, to thereby secure the lens 1655 to the reflector 1605.

Similar to the bracket assembly 310 of FIG. 3, the bracket assembly 1650 of FIGS. 16 and 17 includes a frame 1660 and connectors 140. The frame 1660 can be formed as a single member, with no joints, or by joining together multiple members at one or more joints. The frame 1660 includes side segments 1665a-1665d disposed about at least a portion of the members 1621-1624, respectively, of the reflector 1605.

Each corner 1660a-1660d of the frame 1660 includes at least one pocket 1670 configured to receive a corresponding tab 1625. Each tab 1625 extends from one of the ends 1621a, 1623a, 1624a, and 1624b or one of the segments 1621c, 1622c, 1622d, and 1623d. For example, one or more of the tabs 1625 can be integral to its corresponding end 1621a, 1623a, 1624a, 1624b or segment 1621c, 1622c, 1622d, 1623d. Each tab 1625 is configured to be compressed around at least a portion of a corresponding joint 1626-1629 of the reflector 1605, such that at least a portion of the tab 1625 rests within a corresponding pocket 1670. In certain exemplary embodiments, at least one of the pockets 1625 includes a

hook **1671** configured to engage the corresponding tab **1625**. For example, the hook **1671** can be configured to retain the tab **1625** within the pocket **1670**.

Although specific embodiments of the invention have been described above in detail, the description is merely for purposes of illustration. It should be appreciated, therefore, that many aspects of the invention were described above by way of example only and are not intended as required or essential elements of the invention unless explicitly stated otherwise. Various modifications of, and equivalent steps corresponding to, the disclosed aspects of the exemplary embodiments, in addition to those described above, can be made by a person of ordinary skill in the art, having the benefit of this disclosure, without departing from the spirit and scope of the invention defined in the following claims, the scope of which is to be accorded the broadest interpretation so as to encompass such modifications and equivalent structures.

What is claimed is:

1. A reflector assembly, comprising:
 - a reflector comprising multiple members, pairs of adjacent members forming joints of the reflector, each member comprising at least one integral tab associated with one of the joints of the reflector; and
 - a frame positioned around a periphery of the reflector, the frame comprising corners that correspond to and are disposed around the joints of the reflector, each corner comprising at least one pocket disposed in an outside edge of the frame, each integral tab extending around at least a portion of its associated joint and resting in one of the at least one pocket of the corner of the frame corresponding to the associated joint, thereby securing the frame to the reflector.
2. The reflector assembly of claim 1, wherein the reflector comprises four members arranged in a geometric form that defines a substantially rectangular opening.
3. The reflector assembly of claim 1, wherein at least one of the corners comprises a hook that retains one of the integral tabs in the pocket within which it is resting.
4. The reflector assembly of claim 1, further comprising a lens, and
 - wherein each of the members of the reflector comprises a support segment, the support segments collectively defining a platform on which the lens rests.
5. The reflector assembly of claim 4, wherein at least one of the members of the reflector includes an integral retainer that extends around at least a portion of the lens to secure the lens to the reflector.
6. The reflector assembly of claim 4, wherein the lens forms an acute angle relative to an opening of the reflector.
7. The reflector assembly of claim 1, wherein the frame comprises at least one connector configured to couple the reflector assembly to a collar of a lighting fixture.
8. The reflector assembly of claim 7, wherein each connector comprises:
 - a biasing member; and
 - a lever coupled to the biasing member.
9. The reflector assembly of claim 8, wherein the connector further comprises a resting tab configured to prevent the lever from contacting a flange of the reflector.
10. The reflector assembly of claim 8, wherein the biasing member comprises a torsion spring.
11. The reflector assembly of claim 1, wherein the frame further comprises at least one adjustment tab configured to be received in a notch of a lighting fixture to aid in alignment of the reflector assembly within the lighting fixture.
12. The reflector assembly of claim 1, wherein each of two of the joints comprises a wing formed from segments of

corresponding adjacent members, each segment extending in a direction away from a light dispersion region of the reflector,

wherein, for each wing, two of the integral tabs extend from the wing.

13. A reflector assembly, comprising:

a reflector comprising multiple members that define a light dispersion region, pairs of adjacent members forming joints of the reflector, at least two of the joints comprising a wing formed from outer segments of corresponding adjacent members, each of the outer segments extending in a direction away from the light dispersion region, each member of the reflector comprising:

at least one integral tab associated with one of the joints of the reflector; and

an inner segment extending towards the light dispersion region, the inner segments collectively defining a platform;

a lens resting on the platform; and

a frame positioned around a periphery of the reflector, the frame comprising corners that each correspond to and are disposed around at least a portion of one of the joints of the reflector, each integral tab extending around at least a portion of its associated joint and resting along an outside edge of the corner of the frame corresponding to the associated joint, thereby securing the frame to the reflector.

14. The reflector assembly of claim 13, wherein the lens forms an acute angle relative to an opening of the reflector.

15. The reflector assembly of claim 13, wherein at least one of the corners comprises a hook that retains one of the integral tabs in a pocket disposed in an outside edge of the frame, within which it is resting.

16. The reflector assembly of claim 13, wherein at least one of the members of the reflector includes an integral retainer that extends around at least a portion of the lens to secure the lens to the reflector.

17. The reflector assembly of claim 13, wherein for each joint, the adjacent members forming the joint each comprise one of the integral tabs.

18. A method of assembling a reflector assembly, comprising the steps of:

aligning a plurality of reflective members in a predetermined geometric form, pairs of adjacent reflective members forming joints of the predetermined geometric form, each reflective member comprising a plurality of integral fastening means, the plurality of integral fastening means comprising, for each reflective member, at least one integral tab;

positioning a frame around a periphery of the reflective members; and

attaching the frame to the reflective members and the reflective members to one another by manipulating each of the fastening means, including, for each joint, bending at least one integral tab around at least a portion of the joint so that the integral tab rests along an outside edge of the frame.

19. The method of claim 18, further comprising installing a lens in the reflector assembly by:

placing the lens on a platform defined by segments of the reflective members, the segments extending inwardly, towards a light dispersion region of the reflector assembly; and

securing the lens to the platform by bending at least one integral retainer of the reflective members around at least a portion of the lens.

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20. The method of claim **18**, wherein manipulating each of the fastening means further comprises bending at least one integral tab of a first of the reflective members around at least a portion of a corresponding notch of a second of the reflective

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members, the first of the reflective members disposed adjacent the second of the reflective members.

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